

REMARKS

Amendments to the Claims

Claim 1 was amended by (i) deleting the narrower ranges for x, y, and z; (ii) adding that the clay be treated with an exfoliating agent; and (iii) adding air permeability properties of the nanocomposite. The air permeability properties can be found on page 33, lines 1-5 of the application as filed.

Claim 12 was cancelled and incorporated into claim 1.

Claim 22 was amended to add the treatment of clay with an exfoliating agent and incorporate the limitations of dependent claim 28.

Claim 23 was amended to add the air impermeability properties.

Claim 28 was cancelled and incorporated into claim 22.

Claim 73 and 74 are new and incorporate subject matter previously presented as claim 46 and 47.

No new matter was added.

Claim Objections

Claim 28 was cancelled and the limitations were incorporated into claim 22. Nevertheless, Applicant amended the Markush group per the Examiner's recommendation.

Rejection under 35 U.S.C. 112

Claims 1, 2-3, 5, 9-12, 14, 16, 19, 20 and 28 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention. The Examiner points out that claim 1 recites broad and narrow values for x, y, and z.

Applicants have amended claim 1 by deleting the narrower ranges for x, y, and z. In addition, applicants have cancelled claim 28 and incorporated the limitations into claim 22; in so doing, Applicant eliminated the recitation to any specific halogens. It is requested that the rejection be reconsidered and withdrawn.

Rejections under 35 U.S.C. 102

A. Claims 22-23, and 30-32, 36-37, 40, 42, 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Elspass *et al.* (US 5,807,629).

Elspass is cited for teaching a method for preparing a nanocomposite comprising contacting clay with an elastomer comprising copolymers of isobutylene and functionalized paramethyl styrene, and a grafting promoter. Elspass is further cited as teaching (i) styrene derived units present in 5.5 wt%; (ii) functional groups present in 1.1 wt%; (iii) clay in the amount of 0.1 to 80 wt% of the nanocomposite; (iv) basic claimed method further comprising carbon black and a secondary rubber.

Independent claim 22 now incorporates the subject matter of prior claim 28 – subject matter not taught by Elspass.

Accordingly, as Elspass fails to teach each and every limitation of the recited invention, Elspass fails to anticipate the claimed invention. The rejection under 102(b) over Elspass as set forth in the Office Action is now moot, and it is requested that it be reconsidered and withdrawn.

B. Claims 22 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Li *et al.* (US 6,060,549).

Li is cited for teaching a method of preparing a nanocomposite comprising contacting clay with an elastomer comprising C4-C7 isoolefins containing functionalized paraalkylstyrenes, and a grafting promoter.

Independent claim 22 now incorporates the subject matter of prior claim 28 – subject matter not taught by Li.

Accordingly, as Li fails to teach each and every limitation of the recited invention, Li fails to anticipate the claimed invention. The rejection under 102(b) over Li as set forth in the Office Action is now moot, and it is requested that it be reconsidered and withdrawn.

Rejections under 35 U.S.C. 103(a)

A. Claims 1-3, 5, 9-10, 14, 16, 19-20, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elspass *et al.* (US 5,807,629), in view of Patil (US 5,498,673).

As noted above, Elspass is cited for teaching a nanocomposite comprising clay and an elastomer comprising copolymers of isobutylene and functionalized paramethyl styrene. In the Office Action, it is conceded that Elspass does not teach a monomer functionalized with groups (I-V) of instant claim 1. Patil is cited for teaching copolymers of isoolefins and para-alkylstyrenes functionalized with an R4 moiety corresponding to instant groups (I-V).

Elspass and Patil are cited as teaching the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. It is held that it would have been obvious to combine the para-alkylstyrenes functionalized with R4 groups, as taught by Patil in the invention of Elspass, and one skilled in the art would have been motivated to do so since Patil suggests that such groups have particular utility in forming polymer blends and is an equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes.

Claim 1 presently recites that the nanocomposite incorporate a clay treated with an exfoliating agent to form an exfoliated clay. Neither Elspass nor Patil teaches or suggests such a composition. As a combination of references must disclose each and every element of a recited invention to establish *prima facie* obviousness under §103, the present rejection fails. It is requested that this rejection be reconsidered and withdrawn.

Regarding the rejection of claims 28 and 29, as these are dependent on claim 22, the following is noted. Elspass fails to anticipate claim 22, and Patil fails the remedy the noted deficiency. Thus, the obviousness rejection of the claims also fails. It is requested that this rejection also be reconsidered and withdrawn.

B. Claims 1 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li *et al.* (US 6,060,549), in view of Patil (US 5,498,673).

Li is cited for teaching a nanocomposite comprising a clay treated with an exfoliating agent and an elastomer comprising C4-C7 isoolefins containing up to about 20 mol% of functionalized para-alkylstyrenes. It is conceded that Li does not teach a monomer functionalized with groups (I-V). Patil is cited for teaching copolymers of isoolefins and para-alkylstyrenes functionalized with an R4 moiety corresponding to instant groups (I-V).

Li and Patil are cited as teaching the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. It is held that it would have been obvious to combine the para-alkylstyrenes functionalized with R4 groups, as taught by Patil in the invention of Li, and one would have been motivated to do so since Patil suggests that such groups have particular utility in forming polymer blends and is an equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes. Applicants respectfully disagree.

Li teaches rubber toughened thermoplastic resin nanocomposites that have enhanced impact strength which are comprised of a blend of one or more thermoplastic engineering resins, a copolymer of a C4-C7 isomonoolefin and a para-alkylstyrene, and an exfoliated phyllosilicate clay. There is no teaching in Li that the nanocomposites would have improved air barrier properties with suitable flexibility for use as tire innerliners and innertubes wherein the nanocomposite has a permeation coefficient of less than $7 \text{ mm} \cdot \text{cc} / (\text{m}^2 \cdot \text{day} \cdot \text{mmHg})$ at 40° C . Furthermore, one skilled in the art looking to improve air impermeability for tire innerliners and inner tubes would not look to references such as Li that use thermoplastic engineering resin as the primary component in the nanocomposite. On the contrary, the use of the thermoplastic resin as the primary component and the desired increase in impact strength taught by Li would suggest that the nanocomposite in Li would be used to make generally non-flexible, semi-rigid, shaped articles.

Therefore, Applicants request that the Examiner reconsider and withdraw this rejection.

Non-statutory Double Patenting

The Examiner has provisionally rejected Claims 1-3, 5, 9-12, 14, 16, 19, 20, 22, 23, 28-32, 36-38, 40, 42 and 45 on the ground of non-statutory obviousness-type double patenting as being unpatentable over Claims 1-3, 5-6, 9-11, 13-16, 19-21, 22-24, 28-32, 35-37, 39-42, 45-50, 52-53, 55-56, 59-61, 63-66, 69-71 of co-pending Application No. 10/518,193.

Applicants respectfully submit that, due to the still-unpatented nature of the '193 Application's claims, this rejection should be held in abeyance, e.g., until such point as the pending claims are allowable but for such double patenting rejections. Applicant

respectfully submits that this rejection is not ripe for resolution until all of the claims in the instant case are allowable or issued claims exist in the case to which terminal disclaimers are sought. Upon an indication of allowance of all pending claims in the instant case or if claims issue in the '193 Application, Applicants will submit any proper terminal disclaimers related to those claims.

CONCLUSION

Applicants believe that the foregoing is a full and complete response to the Office Action of record. For the foregoing reasons, Applicants submit that the present claims meet all the requirements for patentability. Accordingly, an early and favorable reconsideration of the rejection, and allowance of pending claims 1-3, 5, 9-12, 14, 16, 19, 20, 22, 23, 28-32, 36-38, 40, 42, 45, 73 and 74 is requested.

The Commissioner is hereby authorized to charge counsel's Deposit Account No. 05-1712 (Docket #: 2002B094), for any fees, including extension of time fees and excess claim fees, required to make this response timely and acceptable to the Office.

Applicants invite the Examiner to telephone the undersigned attorney, if there are any issues outstanding which the Examiner would like to discuss.

Respectfully submitted,

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Date

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